



Teacher Lesson Plan 3 Creating an Undiscovered World

Overview

Inside an observation box, students will create an undiscovered world. After the world is created, each student group characterizes their own world. In later activities, students will exchange worlds, and characterize the world of fellow classmates.

Time

One to two 45 minutes class periods

Objectives

Students will

- Create a world that includes magnetic items and materials supplied by the instructors
- Characterize their world using magnetic probes and height probes
- Determine other possible probes for characterization.

Materials

For the teacher

- | | |
|--|--|
| <input type="checkbox"/> Master copies of the Student Guide 3 | <input type="checkbox"/> Scoring Guide for each student (optional) |
| <input type="checkbox"/> Materials that will be made available to the students | <input type="checkbox"/> Scoring Guide for the overhead |

For each group of two students

- | | |
|--|---|
| <input type="checkbox"/> Small cardboard box with lid.
(Approximately the size to hold jewelry) | <input type="checkbox"/> Clay/ Play Dough |
| <input type="checkbox"/> Grid paper | <input type="checkbox"/> Magnet |
| <input type="checkbox"/> Ruler | <input type="checkbox"/> Magnetic item |
| <input type="checkbox"/> Paper | <input type="checkbox"/> Paper |
| <input type="checkbox"/> Soft items | <input type="checkbox"/> Clay |
| <input type="checkbox"/> Hard items | <input type="checkbox"/> Glue |
| | <input type="checkbox"/> Tape |
| | <input type="checkbox"/> Legos or blocks |

Getting Ready

Gather the materials that the students will use for creating their planets and make copies of the students guides. (This is a perfect activity to use scraps!) When you are gathering materials, try to include materials that have properties your class has studied.

Examples:

Environment-include natural products

Light - include mirrors

States of matter - include liquid and solid substances

pH - acidic and basic liquids (Don't tip box for magnetic probe)

Electricity - electrical conductors and insulators

Wetlands - limit the students to creating a wetland such as a bog, swamp or marsh (line the box with plastic)



Probing the Unknown

NOTE : The students do not need many materials to create a varied structure. For example, a piece of paper can be rolled into ball, shredded, layered or covered in glue.

Place all the materials in containers for each group of 2 or make materials available in the classroom.

Make a world for the motivator. List the materials student can use on the board.

NOTE – all materials in the observation box should be securely glued in place if you are planning to use the magnetic probe on the bottom of the box. A hot or cold glue gun may expedite this securing process. When the observation box is turned upside down for the magnetic force probe, all items should stay in place.

Modification: Correlate the type and variety of the material used to the students' ability level. Even limited materials can be reconfigured multiple ways. As students' ability increases, they can use more materials.

After you have given instructions to make the world, you may want to have your students complete it for homework.

Motivator

Show the students your unknown world.

Say: In this box is an unknown world. It cannot be seen by human eyes but can be examined with probes. Do you have any suggestions?

By now, students may suggest using the height and magnet probe

Say: Now, you will be creating a world that will be probed by another group in the class. In other words, another group in the class will characterize the world you have created. The materials that are available in the classroom are the materials that you should use.

Preparing your Unknown World

Student Guide 3, Procedures 1-3

As a class, brainstorm ideas for creating the planet using the materials provided. Refer to the class list of materials on the board so that students can complete Procedures 1-2 correctly. Give them time to work with their partner to design their planet. After they have made a sketch, check their work.

Making your Unknown World

Student Guide 3, Procedures 4-5

Distribute the materials. Students make their planets, making sure materials are glued into place. Students should revise their sketch after the world is made to reflect what they actually created.



Characterizing your World

Student Guide 3, Procedures 6-7

Distribute scan paper or have students draw a scan in their Student Guide 3. Check each student's world and characterization.

You will need to decide if you would like the students to make an estimated scan of their world or an exact scan. An exact scan will take longer, but it will provide more accurate results. If the scans are made accurately, they can be used as answer keys when the students trade worlds in Lesson 5. This could alleviate some correcting time for you.

Thinking Beyond

Student Guide 3, Procedure 8

In this section the students are asked to think about other possible probes. This question is getting the students prepared for Lesson 4 where each group will design and make their own probe.